(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 648 888 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number : **94307479.9**

(22) Date of filing : **12.10.94**

(51) Int. Cl.[6] : **D06M 15/568**, D06M 15/572, D06N 3/14

(30) Priority : **14.10.93 US 137250**

(43) Date of publication of application : **19.04.95 Bulletin 95/16**

(84) Designated Contracting States : **AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE**

(71) Applicant : **MILLIKEN RESEARCH CORPORATION**
Post Office Box 1927
Spartanburg South Carolina 29304 (US)

(72) Inventor : **Arnott, Robert Charles**
173 Stribling Circle
Spartanburg SC 29301 (US)

(74) Representative : **Ouzman, Beverley Nicola Claire et al**
Murgitroyd and Company,
373 Scotland Street
Glasgow G5 8QA (GB)

(54) Urethane polymer finish for pleated shades in vertical blinds.

(57) This invention provides a urethane polymer finish for textile fabrics utilized in window coverings such as pleated shades and vertical blinds. This finish for window coverings such as pleated shades and/or vertical blinds includes a urethane polymer made from a diisocyanate and either a polyester or a polyether soft segment. The diisocyanate may be either aromatic or aliphatic with an aliphatic diisocyanate preferred to prevent yellowing. The combination of these ingredients are is either carboxylated or emulsified and then neutralized. This urethane polymer may optionally include a halogenated moiety and such as a brominated monomer. Although a one hundred percent urethane polymer finish is preferred, the actual percentage of urethane polymer in the dried finish on the textile fabric may be as low as forty-five percent and still achieve some of the significant qualities of this urethane polymer finish. Some of the these significant qualities of this urethane polymer finish include shape retention, high softening point, flame retardancy, non-blocking, stiffness, non-yellowing and light fastness.

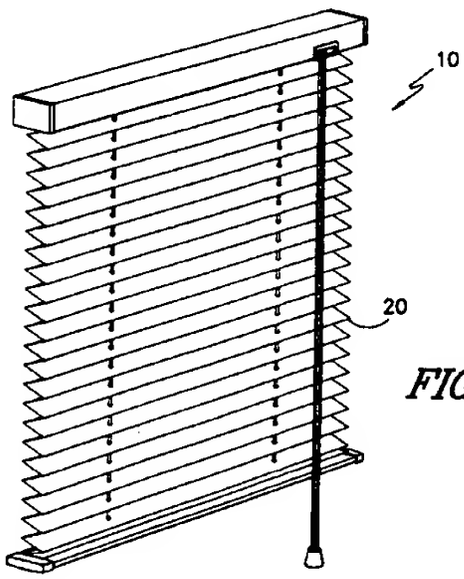

FIG. –1–

EP 0 648 888 A1

BACKGROUND OF THE INVENTION

This invention relates to a urethane polymer finish for textile fabrics utilized in window coverings such as pleated shades and vertical blinds. Window coverings such as pleated shades and/or vertical blinds that are formed of textile fabric as a base material allows for considerable aesthetic variation with regard to types of fabric utilized and the coloration thereof with the advantage of having material with a firm handle that is relatively durable.

The problem with typical finishes for window coverings such as pleated shades and/or vertical blinds formed of textile fabric is that pleat retention dissipates at higher temperatures. With the utilization of these pleated shades and/or vertical blinds within motorized vehicles and other similar locations that are of a relatively high temperature, pleat retention becomes a crucial consideration.

Another problem with typical finishes for window coverings such as pleated shades and/or vertical blinds formed of textile fabric is that formaldehyde, triethylamine, or ammonia is utilized. All of these chemicals can pose a hazard to the environment and the inhalation of formaldehyde has been deem by OSHA to be a health risk at a specified level.

Yet another problem with typical finishes for window coverings such as pleated shades formed of textile material is that hysteresis loss is high.

Still another problem with some typical finishes for window coverings such as pleated shades and/or vertical blinds formed of textile fabric is that typically they do not pass the ASTM 701 Vertical Flame Test and/or the Federal Motor Vehicle Safety Standard 302 Horizontal Flame Test without the specific addition of flame retardant chemicals that can significantly alter the chemical composition of the textile finish.

Another problem with typical finishes for window coverings such as pleated shades and/or vertical blinds formed of textile fabric is that resistance to discoloration is low and light fastness is poor.

Yet another problem with typical finishes for window coverings such as pleated shades formed of textile fabric it that typically the finished fabric will stick to itself in a condition that is technically known as "blocking" during the formation of the pleats.

Another problem of typical finishes for window coverings such as pleated shades and/or vertical blinds formed of textile fabric is that the textile finish has a low softening point.

The present invention solves the above problems in a manner not disclosed in the known prior art.

Summary Of The Invention

This invention provides a urethane polymer finish for textile fabrics utilized in window coverings such as pleated shades and vertical blinds. This finish for window coverings such as pleated shades and/or vertical blinds includes a urethane polymer made from a diisocyanate and either a polyester or a polyether soft segment. The diisocyanate may be either aromatic or aliphatic with an aliphatic diisocyanate preferred to prevent yellowing. The combination of these ingredients is either carboxylated or emulsified and then neutralized. This urethane polymer may optionally include a halogenated moiety, such as a brominated monomer. Although a one hundred percent urethane polymer finish is preferred, the actual percentage of urethane polymer in the dried finish on the textile fabric may be as low as forty-five percent and still achieve some of the significant qualities of this urethane polymer finish. Some of the these significant qualities of this urethane polymer finish include shape retention, high softening point, flame retardancy, non-blocking, stiffness, non-yellowing and light fastness.

It is an advantage of this invention to have window coverings such as pleated shades formed of textile fabric that have a high degree of pleat retention.

Another advantage of this invention is that window coverings such as pleated shades and/or vertical blinds formed of textile fabric are relatively stiff.

Yet another advantage of this invention is that window coverings such as pleated shades and/or vertical blinds formed of textile fabric utilizes a finish that does not include either formaldehyde, triethylamine or ammonia.

Another advantage of this invention is that hysteresis loss for window coverings such as pleated shades formed of textile fabric is very low.

Yet another advantage of this invention is that the textile fabric forming pleated shades and/or vertical blinds does not block unto itself.

Another advantage of this invention is that the pleated shades and/or vertical blinds have very high resistance to discoloration with a high degree of light fastness.

These and other advantages will be in part apparent and in part pointed out below:

Brief Description Of The Drawings

The above as well as other objects of the invention will become more apparent from the following detailed description of the preferred embodiment of the invention, which when taken together with the accompanying drawings, in which:

FIG. 1 is a front perspective view of a pleated shade formed of textile fabric having the urethane polymer finish of the present invention;

FIG. 2 is a front perspective view of vertical blinds formed of textile fabric having the urethane polymer finish of the present invention;

FIG. 3 is a schematic side elevational view of the pleated shades formed of textile fabric as shown in FIG. 1 and having a chemical finish in which the pleated shades have not been subjected to heat for an extended period of time;

FIG. 4 is a schematic side elevational view of the pleated shades formed of textile fabric as shown in FIG. 1 and having a chemical finish in which the pleated shades have been subjected to 170°F for a period of five days;

FIG. 5 is a graph of the percentage of pad concentration of polyester urethane (SANCURE® 1049A) versus stiffness for a textile fabric weighing approximately 3 ounces that is treated with a urethane polymer finish;

FIG. 6 is a graph of the percentage of pad concentration of polyester urethane (SANCURE® 1049A) versus stiffness for a textile fabric weighing approximately 1.7 ounces that is treated with a urethane polymer finish;

FIG. 7 is a graph demonstrating the softening point of a film made from the finish of present invention displaying needle penetration in millimeters versus temperature in Celsius;

FIG. 8 is a graph representing pleat retention at 150°F for textile fabric with a finish of the present invention versus textile fabric having a traditional vinyl chloride polymer finish;

FIG. 9 is a graph representing pleat retention at 170°F for textile fabric with a finish of the present invention versus textile fabric having a traditional vinyl chloride polymer finish and a traditional acrylic polymer finish with formaldehyde;

Detailed Description of the Preferred Embodiment

This invention relates to an improved finish for window coverings such as pleated shades and/or vertical blinds formed of textile fabric with a high degree of stiffness, no formaldehyde emission, and excellent flame retardancy. Additional properties include the ability to make a pleated structure with excellent resistance to deformation and aging at high temperatures of 150-170°F.

The present invention includes a fabric substrate that is coated with a urethane polymer. This textile fabric can be any of a wide variety of woven or non-woven fabrics since this urethane polymer finish does not react with the textile substrate. The preferred weight range of the textile fabric is between 1.7 and 4 ounces per square yard. However, the yarns making up the textile fabric can be of virtually any denier with the only constraint being that the textile fabric cannot be either too heavy or too light to form suitable window coverings.

The preferred embodiment of this urethane polymer finish is a 100% urethane polymer system, although as will be later shown and described, urethane blends are suitable. The physical properties of urethane polymers are relatively easy to obtain. The specific structural properties are proprietary, so that the only information available is whether the urethane polymer is aromatic or aliphatic, polyether or polyester, or whether carboxyl groups or cross-linking is present. The first ingredient of this urethane polymer is diisocyanate. Aliphatic diisocyanates are preferred over aromatic diisocyanates due to the possible yellowing of the textile fabric that may occur with aromatic polyurethanes. The second major ingredient is either a polyester or polyether soft segment. Although a polyester soft segment is preferred, either a polyether or polyester soft segment will suffice. Optionally, due to the presence of carboxyl groups, cross-linking can occur. A third ingredient, a halogenated moiety is deemed optional and provides flame retardant qualities for the textile finish. The preferred halogen is bromide, although chloride is a possible substitute. The preferred form of the halogenated moiety is for a monomer to be polymerized into the urethane polymer itself.

Referring now to FIG. 1, a pleated shade window covering is generally indicated by numeral 10, while the individual pleats formed of textile fabric having a urethane polymer finish are represented by numeral 20. FIG. 2 is a vertical blind mechanism with an individual vertical blind slat formed of textile fabric having a urethane polymer finish and indicated by numeral 27. Both FIG. 1 and FIG. 2 demonstrate the two main types of window coverings that utilize textile fabric and can been stiffened by a chemical finish.

Two typical examples of known chemical finishes for textile fabrics include polyvinyl chloride and an acrylic polymer. An example of an application of an acrylic polymer as a chemical finish for a three ounce, one hundred

percent polyester fabric can be found in TABLE 1. The specific acrylic polymer is RHOPLEX® AC-604 manufactured by Rohm and Haas Company located at Independence Mall West, Philadelphia, Pennsylvania 19105. The components of this product include: an acrylic polymer, individual residual monomers, formaldehyde, triethylamine, methanol, melamine-formaldehyde resin, and water. Formaldehyde and triethylamine are deemed hazardous chemicals. Table 1 shows that in this specific example, there was 23% of this chemical in a water bath. When this chemical was then padded on three ounce, one hundred percent polyester textile fabric, the percentage of finish in relation to the total weight of the fabric and dried finish was approximately 20%. Stiffness was measured by a Handle-O-Meter that can be manufactured by Thwing-Albert Instrument Company located at 10960 Dutton Road, Philadelphia, Pennsylvania 19154. There is a ten millimeter gap in which a knife presses down on the textile fabric having the RHOPLEX® AC-604 finish. The force is measured in grams. The warp yarn bending number is typically the lower since it bends the fabric parallel to the warp yarns which is actually across the filling yarns while the higher number is the filling yarn bending number measuring the bending of textile fabric parallel to the filling yarns which is actually across the warp yarns. The stiffness across the filing yarns was 104 grams and the stiffness across the warp yarns was measured as 281 grams. Hysteresis demonstrates the ability of the textile fabric retain its original shape. Nine additional stiffness measurements are made in both the warp and filling directions with the largest difference between stiffness measurements being divided by the initial stiffness measurement in that direction. The larger the negative value indicates the decreased stability of the finished textile fabric to return to its original shape. Hysteresis is shown in Table 1 as a -22/-25. An imperative aspect of the chemical finish for window covering textile fabric is that it does not stick to itself. This is technically referred to as "blocking". The blocking test is conducted by placing finished textile fabric face to face or back to back with a five pound per square inch weight on the finished textile fabric in an oven at 180°C. for one hour. During that time, the finished textile fabric should not stick to itself after cooling. With a three ounce polyester fabric padded with twenty percent RHOPLEX® AC-604, there is typically no blockage at 350°F. The Federal Motor Vehicle Safety Standard 302 Horizontal Flame test fails for this acrylic polymer chemical finish as well as the ASTM 701 Vertical Flame test. Light fastness is conducted by placing textile fabric having a chemical finish under a xenon light bulb for eighty hours. The finished textile fabric is then compared to predetermined set standard specimens. Values range between zero and five with five being complete color retention and zero being absolutely no color retention. Light fastness for RHOPLEX® AC-604 applied to three ounce polyester fabric is 4.5.

Another typical known finish is a polyvinyl chloride finish. An example of this is GEON® 460X49 manufactured by B. F. Goodrich Company, Specialty Polymers and Chemicals Division that located at 911 Brecksville Road, Cleveland, Ohio 44141-3247. This is a synthetic anionic colloidal emulsion of vinyl chloride copolymer 49% (in water 51%). A specific application of GEON® 460X49 to three ounce, one hundred percent polyester fabric can be found in TABLE 2. In this Example, the percentage of chemical in the water bath is 11.5% and the percentage of finish in relationship to the total weight of the fabric and dried finish is 10.5%. Stiffness measured across the filling yarns is 50 grams, while the stiffness across the warp yarns is 147 grams. As previously stated, stiffness across the warp yarns means stiffness making a knife measurement perpendicular to the warp yarns which is actually parallel to the filling yarns and the stiffness across the filling yarns is measured by placing the knife parallel to the warp yarns. This three ounce polyester fabric treated by GEON® 460X49 would appear to pass both the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test and the ASTM 701 Vertical Flame test. Light fastness was experimentally determined to be 3.5 on the scale of five.

A significant quality of this invention is the ability to retain pleat retention. Referring now to FIGS. 3 and 4, a vertical shade generally designated as numerals 30A and 30B, respectively. As shown in FIG. 3, the angle 40A between pleats is almost the same at the top of pleated shade 30A as it is near the bottom of pleated shade 30A as shown by angle 42A. As shown in FIG. 4, after being subjected to heat such as between 150 to 170 degrees Fahrenheit for a duration of three to five eight hour days, the angle between the pleated shades as designated by 40B at the upper part of the pleated shade 30B increases while the angle between the pleated shades as designated by 42B at the lower part of the pleated shade 30B decreases. This increasing angle 40B, as shown in FIG. 4, is displayed in FIG. 8 for various finishes that have been subjected for up to five days of eight hours per day in a heated environment. The line designated by the numeral 120 indicates a polyvinyl chloride finish. The line designated by the numeral 122 designates an acrylic polymer with formaldehyde finish. The line designated by numeral 124 is a urethane polymer finish of the present invention that is coating a 1.7 ounces per square yard, one hundred percent polyester fabric and line indicated by numeral 126 is another urethane polymer finish of the present invention coating a 3.0 ounce per square yard, one hundred percent polyester fabric. As shown in FIG. 8, the pleat retention for urethane polymer finishes is significantly better then for PVC or acrylic polymers. This presents a significant advantage for urethane polymer textile coating.

FIG. 9 discloses pleat retention at 170 degrees Fahrenheit for duration of five days whereby each day is an eight hour day with heat and a sixteen hour cooling period where the temperature is 72 degrees Fahrenheit.

The top two lines designated by numerals 130 and 132, respectively demonstrate the application of a polyvinyl chloride finish. As shown, angle 40B as found on FIG. 4 will vary dramatically. The two lines designated by numerals 134 and 136, respectively demonstrate the application of a urethane polymer finish in which the pleat retention angle 40B as shown in FIG. 4 will not vary significantly and appears to stabilize after the third day of subjecting the textile fabric to a temperature of 170 degrees Fahrenheit.

A crucial aspect about this new innovative process is the aspect of stiffness with regard to window coverings such as pleated shades and vertical blinds. As shown in FIG. 5, any padding application beyond 14% of solids on a 3 ounce per square yard polyester fabric does not enhance the stiffness to any measurable extent. As shown in FIG. 5, the line designating the stiffness taken across the filling yarns by applying a knife in a 10 millimeter slot parallel to the warp yarns is designated by numeral 112. The line designating the stiffness taken across the warp yarns by applying a knife in a 10 millimeter slot parallel to the filing yarns is designated by numeral 110.

As shown in FIG. 6, a similar graph of stiffness versus percent solids in a pad bath is graphed. The line of stiffness taken across the filling yarns by bending of the warp yarns in a direction parallel thereto is designated by numeral 116. The line of stiffness taken across the warp yarns by bending of the filing yarns in a direction parallel thereto is designated by numeral 114. Once again, any additional padding of over 14% does not provide significant increase in stiffness.

Another significant aspect of this urethane polymer coating is a very high softening point. The softening point is determined by needle penetration in the coated fabric. As shown by the line designated numeral 118, as shown in FIG. 7, there is very little or no penetration of the needle up to 100°C. This provides a significant advantage over vinyl chloride or acrylic polymers.

It would appear that at least a 45% composition of urethane polymer in any blend is required to obtain the desired properties, while seventy-five percent provides a significant improvement in virtually significant properties and ninety percent is almost as good as one hundred percent with one hundred percent being the preferred composition of the chemical finish. Furthermore, with the 100% urethane polymer formulations, only 14% is typically needed to be added to a water bath.

Some of the significant qualities of this invention include the fact that the pleating characteristics are excellent, ageing properties at room temperature and high temperature are excellent, shade hysteresis is very low, good resistance to discoloration and the light fastness of polyester fabric is excellent with usually a reading of four and above.

This urethane polymer finish or blend thereof can be applied by either padding or coating. An example of a means of coating is disclosed in U.S. Patent No. 5,110,666, issued May 5, 1992, which is hereby incorporated by reference. An example of a means of padding is disclosed in U.S. Patent No. 5,240,644, issued August 31, 1993, which is hereby incorporated by reference.

The invention will now be illustrated further by the following, non-limiting, Examples.

EXAMPLE 1

Referring now to TABLE 3, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a polymer made from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer that is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The percentage of polymer from SANCURE® 1049A in a water bath is 14% while the percentage of finish in relationship to total weight of fabric and dried finish is 15%. The stiffness measurement taken across the warp yarns is 41 grams while the stiffness measurement taken across the filing yarns is 45 grams. The blocking test passes at a temperature of 350°F. There is also passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as passage of the ASTM 701 Vertical Flame Test, with results of 4.1, 0, 0 inches in the warp direction and 4.3, 0, 0 inches in the filling direction. Light fastness provides a reading of 4.0 for this fabric of a red color when exposed to a xenon bulb for eighty hours and compared to a set standard. The length of a 14" flat fabric after pleating is 2.75 inches for this specific Example which extends out to six inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 2

Referring now to TABLE 4, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a polymer made from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer that is commercially available as SANCURE® 12194 whose additional known ingredients

are unknown. SANCURE® 12194 is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The percentage of polymer from SANCURE® 12194 in a water bath is 14% while the percentage of finish in relationship to total weight of fabric and dried finish is 11.7%. The stiffness measurement taken across the filling yarns is 14.5 grams while the stiffness measurement taken across the warp yarns is 28 grams. There is passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction with the finished textile fabric self-extinguishing, as well as passage of the ASTM 701 Vertical Flame Test, with results of 5.1, 0, 0 inches in the warp direction and 5.3, 0, 0 inches in the filling direction.

EXAMPLE 3

Referring now to TABLE 5, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a polymer made from an aliphatic diisocyanate with a polyester soft segment that is commercially available as SANCURE® 861 whose additional known ingredient includes triethylamine. SANCURE® 861 is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The percentage polymer from SANCURE® 861 in a water bath is 14%. The stiffness measurement taken across the filling yarns is 13.5 grams while the stiffness measurement taken across the warp yarns is 27.5 grams. There is passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction with the treated textile fabric self extinguishing in both cases, as well as passage of the ASTM 701 Vertical Flame Test, with results of 5.3, 0, 0 inches in the warp direction and 4.4, 0, 0 inches in the filling direction. Light fastness provides a reading of 4.0 for the fabric when exposed to a xenon bulb for eighty hours and compared to a set standard.

EXAMPLE 4

Referring now to TABLE 6, this Example involves the padding of a 100% polyester fabric that is 3.0 ounces per square yard with a polymer made from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer that is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The percentage of polymer from SANCURE® 1049A in a water bath is 14% while the percentage of finish in relationship to total weight of fabric and dried finish is 11.9%. The stiffness measurement taken across the filling yarns is 64 grams while the stiffness measurement taken across the warp yarns is 197 grams. The blocking test passes at a temperature of 350°F. There is also passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction with the self extinguishing of the textile fabric in both directions, as well as passage of the ASTM 701 Vertical Flame Test, with results of 4.5, 0, 0 inches in the warp direction and 2.6, 0, 0 inches in the filling direction. Light fastness provides a reading of 4-5 for the fabric when exposed to a xenon bulb for eighty hours and compared to a set standard.

The length of a pleated section made from 14 inches of fabric is 2.0 inches for this specific Example which extends out to 3.75 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 5

Referring now to TABLE 7, this Example involves the padding of a 100% polyester fabric that is 3.0 ounces per square yard with a polymer made from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer that is commercially available as SANCURE® 12194 whose additional known ingredients are unknown. SANCURE® 12194 is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The percentage of polymer from SANCURE® 12194 in a water bath is 14% while the percentage of finish in relationship to total weight of fabric and dried finish is 13%. The stiffness measurement taken across the filling yarns is 34 grams while the stiffness measurement taken across the warp yarns is 95 grams. There is failure of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in the warp direction and a passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in the filling direction with the finished textile fabric self-extinguishing.

EXAMPLE 6

Referring now to TABLE 8, this Example involves the padding of a 100% polyester fabric that is 3.0 ounces per square yard with a polymer made from an aliphatic diisocyanate and a polyester soft segment that is com-

mercially available as SANCURE® 861 whose additional known ingredient includes triethylamine. SANCURE® 861 is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The percentage of polymer from SANCURE® 861 in a water bath is 14%. The stiffness measurement taken across the filling yarns is 33 grams while the stiffness measurement taken across the warp yarns is 95 grams. There is passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction with the treated textile fabric self extinguishing in both cases, as well as passage of the ASTM 701 Vertical Flame Test, with results of 4.2, 0, 0 inches in the warp direction and 4.7, 0, 0 inches in the filling direction. The blocking test passes at 350° F.

EXAMPLE 7

Referring now to TABLE 9, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with an acrylic polymer. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The specific acrylic polymer is RHOPLEX® AC-604 manufactured by Rohm and Haas Company located at Independence Mall West, Philadelphia, Pennsylvania 19105. The components of this product include: an acrylic polymer, individual residual monomers, formaldehyde, triethylamine, methanol, melamine-formaldehyde resin, and water.

The percentage of the blend of SANCURE® 1049A and RHOPLEX® AC-604 in a water bath is 40% while the percentage of finish in relationship to total weight of fabric and dried finish is 34%. The stiffness measurement taken across the filling yarns is 56 grams while the stiffness measurement taken across the warp yarns is 71 grams. The blocking test passes at a temperature of 350°F. There is a failure of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a failure of the ASTM 701 Vertical Flame Test, in both the warp direction and in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is .75 to 1. The results in the urethane polymer being 42.8 percent of the chemical blend.

EXAMPLE 8

Referring now to TABLE 10, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with an acrylic polymer. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The specific acrylic polymer is RHOPLEX® AC-604 manufactured by Rohm and Haas Company located at Independence Mall West, Philadelphia, Pennsylvania 19105. The components of this product include: an acrylic polymer, individual residual monomers, formaldehyde, triethylamine, methanol, melamine-formaldehyde resin, and water.

The percentage of the blend of SANCURE® 1049A and RHOPLEX® AC-604 in a water bath is 37.8% while the percentage of finish in relationship to total weight of fabric and dried finish is 32.4%. The stiffness measurement taken across the filling yarns is 51 grams while the stiffness measurement taken across the warp yarns is 63 grams. The blocking test passes at a temperature of 350°F. There is a failure of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a failure of the ASTM 701 Vertical Flame Test, in both the warp direction and in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is 2.3 to 1. The results in the urethane polymer being 69.7 percent of the chemical blend. The distance of a pleated section of the fabric made from a 14 inch sample is 1.25 inches for this specific Example which extends out to 3.75 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 9

Referring now to TABLE 11, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with an acrylic polymer. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor In-

dustries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The specific acrylic polymer is RHOPLEX® AC-604 manufactured by Rohm and Haas Company located at Independence Mall West, Philadelphia, Pennsylvania 19105. The components of this product include: an acrylic polymer, individual residual monomers, formaldehyde, triethylamine, methanol, melamine-formaldehyde resin, and water.

The percentage of the total polymer from SANCURE® 1049A and RHOPLEX® AC-604 in a water bath is 14% while the percentage of finish in relationship to total weight of fabric and dried finish is 10-12%. The stiffness measurement taken across the filling yarns is 35 grams while the stiffness measurement taken across the warp yarns is 54 grams. Hysteresis demonstrates the ability of the textile fabric retain its original shape. Nine additional stiffness measurements are made in both the warp and filling directions with the largest difference between stiffness measurements being divided by the initial stiffness measurement in that direction. The larger the negative value indicates the decreased stability of the finished textile fabric to return to its original shape. The hysteresis found in TABLE 11 is negative 18 across the warp and a negative 15 across the filling. The blocking test passes at a temperature of 350°F. There is a failure of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a failure of the ASTM 701 Vertical Flame Test, in both the warp direction and in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is 1 to 1. The results in the urethane polymer being 50 percent of the chemical blend. The distance of a pleated section is 1.75 inches for this specific Example which extends out to 5.5 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 10

Referring now to TABLE 12, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with an acrylic polymer. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The specific acrylic polymer is RHOPLEX® AC-604 manufactured by Rohm and Haas Company located at Independence Mall West, Philadelphia, Pennsylvania 19105. The components of this product include: an acrylic polymer, individual residual monomers, formaldehyde, triethylamine, methanol, melamine-formaldehyde resin, and water.

The percentage of the polymer from the blend of SANCURE® 1049A and RHOPLEX® AC-604 in a water bath is 14% while the percentage of finish in relationship to total weight of fabric and dried finish is 10-12%. The stiffness measurement taken across the filling yarns is 34 grams while the stiffness measurement taken across the warp yarns is 47 grams. Hysteresis demonstrates the ability of the textile fabric retain its original shape. Nine additional stiffness measurements are made in both the warp and filling directions with the largest difference between stiffness measurements being divided by the initial stiffness measurement in that direction. The larger the negative value indicates the decreased stability of the finished textile fabric to return to its original shape. The hysteresis found in TABLE 12 is negative 18 across the warp and a negative 13 across the filling. The blocking test passes at a temperature of 350°F. There is a failure of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a failure of the ASTM 701 Vertical Flame Test, in both the warp direction and in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is 3 to 1. The results in the urethane polymer being 75 percent of the chemical blend. The distance of a pleated section is 1.75 inches for this specific Example which extends out to 5.125 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 11

Referring now to TABLE 12, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with a polyvinyl chloride. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The polyvinyl chloride is GEON® 460X49 manufactured by B. F. Goodrich Company, Specialty Polymers and Chemicals Division that located at 911 Brecksville Road, Cleveland, Ohio 44141-3247. This is a synthetic anionic colloidal emulsion of vinyl chloride copolymer 49% (in water 51%).

The percentage of the polymer solids from the blend of SANCURE® 1049A and GEON® 460X49 in a water bath is 42.5% while the percentage of finish in relationship to total weight of fabric and dried finish is 36%. The

stiffness measurement taken across the filling yarns is 50 grams while the stiffness measurement taken across the warp yarns is 84 grams. The blocking test fails slightly at a temperature of 350°F. There is a failure of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a failure of the ASTM 701 Vertical Flame Test, in both the warp direction and in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is .7 to 1. The results in the urethane polymer being 41.2 percent of the chemical blend. The length of a pleated section is 1.0 inches for this specific Example which extends out to 6 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 12

Referring now to TABLE 14, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with a polyvinyl chloride. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The polyvinyl chloride is GEON® 460X49 manufactured by B. F. Goodrich Company, Specialty Polymers and Chemicals Division that located at 911 Brecksville Road, Cleveland, Ohio 44141-3247. This is a synthetic anionic colloidal emulsion of vinyl chloride copolymer 49% (in water 51%).

The percentage of the polymers from a blend of SANCURE® 1049A and GEON® 460X49 in a water bath is 38.8% while the percentage of finish in relationship to total weight of fabric and dried finish is 33%. The stiffness measurement taken across the filling yarns is 46 grams while the stiffness measurement taken across the warp yarns is 67 grams. The blocking test fails slightly at a temperature of 350°F. There is passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a passage of the ASTM 701 Vertical Flame Test, in the warp direction and failure of the ASTM Vertical Flame Test in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is 2.1 to 1. The results in the urethane polymer being 67.7 percent of the chemical blend. The length of a pleated section is 1.5 inches for this specific Example which extends out to 4.75 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 13

Referring now to TABLE 15, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with a polyvinyl chloride. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The polyvinyl chloride is GEON® 460X49 manufactured by B. F. Goodrich Company, Specialty Polymers and Chemicals Division that located at 911 Brecksville Road, Cleveland, Ohio 44141-3247. This is a synthetic anionic colloidal emulsion of vinyl chloride copolymer 49% (in water 51%).

The percentage of polymer solids from the blend of SANCURE® 1049A and GEON® 460X49 in a water bath is 14% while the percentage of finish in relationship to total weight of fabric and dried finish is 10-12%. The stiffness measurement taken across the filling yarns is 32 grams while the stiffness measurement taken across the warp yarns is 44 grams. Hysteresis demonstrates the ability of the textile fabric retain its original shape. Nine additional stiffness measurements are made in both the warp and filling directions with the largest difference between stiffness measurements being divided by the initial stiffness measurement in that direction. The larger the negative value indicates the decreased stability of the finished textile fabric to return to its original shape. The hysteresis found in TABLE 15 is a negative 18 across the warp and a negative 18 across the filling. The blocking test passes at a temperature of 350°F. There is passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a passage of the ASTM 701 Vertical Flame Test, in both the warp direction and in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is 1 to 1. The results in the urethane polymer being 50 percent of the chemical blend. The length of a pleated section is 1.5 inches for this specific Example which extends out to 6.75 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 14

Referring now to TABLE 16, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with a polyvinyl chloride. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The polyvinyl chloride is GEON® 460X49 manufactured by B. F. Goodrich Company, Specialty Polymers and Chemicals Division that located at 911 Brecksville Road, Cleveland, Ohio 44141-3247. This is a synthetic anionic colloidal emulsion of vinyl chloride copolymer 49% (in water 51%).

The percentage of polymer solids from the blend of SANCURE® 1049A and GEON® 460X49 in a water bath is 14% while the percentage of finish in relationship to total weight of fabric and dried finish is 10-12%. The stiffness measurement taken across the filling yarns is 31 grams while the stiffness measurement taken across the warp yarns is 49 grams. Hysteresis demonstrates the ability of the textile fabric retain its original shape. Nine additional stiffness measurements are made in both the warp and filling directions with the largest difference between stiffness measurements being divided by the initial stiffness measurement in that direction. The larger the negative value indicates the decreased stability of the finished textile fabric to return to its original shape. The hysteresis found in TABLE 16 is a negative 18 across the warp and a negative 14 across the filling. The blocking test passes at a temperature of 350°F. There is passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a passage of the ASTM 701 Vertical Flame Test in the warp direction and a failure of the ASTM Vertical Flame Test in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is 3 to 1. The results in the urethane polymer being 75 percent of the chemical blend. The length of a pleated section is 2 inches for this specific Example which extends out to 5.75 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 15

Referring now to TABLE 17, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with an acrylic polymer. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The specific acrylic polymer is RHOPLEX® HA-16 is manufactured by Rohm and Haas Company located at Independence Mall West, Philadelphia, Pennsylvania 19105. RHOPLEX® HA-16 includes acrylic polymer, individual residual monomers, formaldehyde, and water.

The percentage of polymer solids from the blend of SANCURE® 1049A and RHOPLEX® HA-16 in a water bath is 40% while the percentage of finish in relationship to total weight of fabric and dried finish is 34%. The stiffness measurement taken across the filling yarns is 45 grams while the stiffness measurement taken across the warp yarns is 67 grams. The blocking test passes at a temperature of 350°F. There is a failure of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a failure of the ASTM 701 Vertical Flame Test, in both the warp direction and in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is .75 to 1. The results in the urethane polymer being 42.8 percent of the chemical blend. The length of a pleated section is 1.5 inches for this specific Example which extends out to 5.125 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 16

Referring now to TABLE 18, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with an acrylic polymer. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The specific acrylic polymer is RHOPLEX® HA-16 is manufactured by Rohm and Haas Company located at Independence Mall West, Philadelphia, Pennsylvania 19105. RHOPLEX® HA-16 includes acrylic polymer, individual residual monomers, for-

maldehyde, and water.

The percentage of polymer solids from the blend of SANCURE® 1049A and RHOPLEX® HA-16 in a water bath is 37.8% while the percentage of finish in relationship to total weight of fabric and dried finish is 32.4%. The stiffness measurement taken across the filling yarns is 51 grams while the stiffness measurement taken across the warp yarns is 65 grams. The blocking test passes at a temperature of 350°F. There is a failure of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a passage of the ASTM 701 Vertical Flame Test in the warp direction and a failure of the ASTM 701 Vertical Flame Test in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is 2.3 to 1. The results in the urethane polymer being 69.7 percent of the chemical blend. The length of a pleated section is 1.5 inches for this specific Example which extends out to 3.75 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 17

Referring now to TABLE 19, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with an acrylic polymer. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The specific acrylic polymer is RHOPLEX® HA-16 is manufactured by Rohm and Haas Company located at Independence Mall West, Philadelphia, Pennsylvania 19105. RHOPLEX® HA-16 includes acrylic polymer, individual residual monomers, formaldehyde, and water.

The percentage of polymer solids from the blend of SANCURE® 1049A and RHOPLEX® HA-16 in a water bath is 36.8% while the percentage of finish in relationship to total weight of fabric and dried finish is 31.5%. The stiffness measurement taken across the filling yarns is 46 grams while the stiffness measurement taken across the warp yarns is 65 grams. The blocking test passes at a temperature of 350°F. There is a passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a passage of the ASTM 701 Vertical Flame Test in the warp direction and in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is 3.8 to 1. The results in the urethane polymer being 79.1 percent of the chemical blend. The length of the pleated section is 1.75 inches for this specific Example which extends out to 4.0 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 18

Referring now to TABLE 20, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with an acrylic polymer. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The specific acrylic polymer is RHOPLEX® HA-16 is manufactured by Rohm and Haas Company located at Independence Mall West, Philadelphia, Pennsylvania 19105. RHOPLEX® HA-16 includes acrylic polymer, individual residual monomers, formaldehyde, and water.

The percentage of polymer solids from the blend of SANCURE® 1049A and RHOPLEX® HA-16 in a water bath is 14% while the percentage of finish in relationship to total weight of fabric and dried finish is 10-12%. The stiffness measurement taken across the filling yarns is 31 grams while the stiffness measurement taken across the warp yarns is 41 grams. Hysteresis demonstrates the ability of the textile fabric retain its original shape. Nine additional stiffness measurements are made in both the warp and filling directions with the largest difference between stiffness measurements being divided by the initial stiffness measurement in that direction. The larger the negative value indicates the decreased stability of the finished textile fabric to return to its original shape. The hysteresis found in TABLE 20 is negative 31 across the warp and a negative 17 across the filling. The blocking test passes at a temperature of 350°F. There is a passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a passage of the ASTM 701 Vertical Flame Test in the warp direction and a failure of the ASTM Vertical Flame Test in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is 1 to 1. The results in the urethane polymer being 50 percent of the chemical blend. The length of a pleated section is 2.0 inches for this specific Example which extends out to 6.75 inches in one hour when subjected to a temperature of

170°F.

EXAMPLE 19

Referring now to TABLE 21, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with an acrylic polymer. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The specific acrylic polymer is RHOPLEX® HA-16 is manufactured by Rohm and Haas Company located at Independence Mall West, Philadelphia, Pennsylvania 19105. RHOPLEX® HA-16 includes acrylic polymer, individual residual monomers, formaldehyde, and water.

The percentage of polymer solids from the blend of SANCURE® 1049A and RHOPLEX® HA-16 in a water bath is 14% while the percentage of finish in relationship to total weight of fabric and dried finish is 10-12%. The stiffness measurement taken across the filling yarns is 33 grams while the stiffness measurement taken across the warp yarns is 41 grams. Hysteresis demonstrates the ability of the textile fabric retain its original shape. Nine additional stiffness measurements are made in both the warp and filling directions with the largest difference between stiffness measurements being divided by the initial stiffness measurement in that direction. The larger the negative value indicates the decreased stability of the finished textile fabric to return to its original shape. The hysteresis found in TABLE 21 is a negative 15 across the warp and a negative 9.6 across the filling. The blocking test passes at a temperature of 350°F. There is a passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a passage of the ASTM 701 Vertical Flame Test in the warp direction and a failure of the ASTM Vertical Flame Test in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is 3 to 1. The results in the urethane polymer being 75 percent of the chemical blend. The length of a pleated section is 2.0 inches for this specific Example which extends out to 6.125 inches in one hour when subjected to a temperature of 170°F.

EXAMPLE 20

Referring now to TABLE 22, this Example involves the padding of a 100% polyester fabric that is 1.7 ounces per square yard with a urethane polymer formed from an aliphatic diisocyanate with a polyester soft segment and a brominated monomer blended with an acrylic polymer. The urethane polymer is commercially available as SANCURE® 1049A whose additional known ingredients include 2-pyrrolidinone, 1 methyl, dipropylene glycol, monomethyl ether, and n,n dimethylethanolamine. SANCURE® 1049A is manufactured by Sanncor Industries, Inc. located at 300 Whitney Street, Leominster, Massachusetts 01453. The specific acrylic polymer is RHOPLEX® HA-16 is manufactured by Rohm and Haas Company located at Independence Mall West, Philadelphia, Pennsylvania 19105. RHOPLEX® HA-16 includes acrylic polymer, individual residual monomers, formaldehyde, and water.

The percentage of polymer solids from the blend of SANCURE® 1049A and RHOPLEX® HA-16 in a water bath is 14% while the percentage of finish in relationship to total weight of fabric and dried finish is 10-12%. The stiffness measurement taken across the filling yarns is 30 grams while the stiffness measurement taken across the warp yarns is 41 grams. Hysteresis demonstrates the ability of the textile fabric retain its original shape. Nine additional stiffness measurements are made in both the warp and filling directions with the largest difference between stiffness measurements being divided by the initial stiffness measurement in that direction. The larger the negative value indicates the decreased stability of the finished textile fabric to return to its original shape. The hysteresis found in TABLE 22 is negative 18 across the warp and a negative 16 across the filling. The blocking test passes at a temperature of 350°F. There is a passage of the Federal Motor Vehicle Safety Standard 302 Horizontal Flame test in both the warp and the filling direction, as well as a passage of the ASTM 701 Vertical Flame Test in the warp direction and in the filling direction. The ratio of the urethane polymer to the remainder of the chemical solids is 5 to 1. The results in the urethane polymer being 83.3 percent of the chemical blend. The length of a pleated section is 2.0 inches for this specific Example which extends out to 5.75 inches in one hour when subjected to a temperature of 170°F.

TABLE NO. 1 PRIOR ART FINISH APPLIED TO 3 OZ., 100% POLYESTER FABRIC	
CHEMICAL	RHOPLEX® AC-604
MANUFACTURER	ROHM AND HAAS COMPANY
KNOWN CHEMICAL COMPOSITION	ACRYLIC POLYMER, INDIVIDUAL RESIDUAL MONOMERS, FORMALDEHYDE, TRIETHYLAMINE, METHANOL, MELAMINE-FORMALDEHYDE RESIN AND WATER.
PERCENTAGE OF CHEMICAL IN WATER BATH	23%
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	20%
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	281/104
HYSTERESIS	-22/-25
BLOCKING	PASS
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	FAIL
ASTM 701 VERTICAL FLAME TEST	FAIL
LIGHT FASTNESS	4.5

TABLE NO. 2 PRIOR ART FINISH APPLIED TO 3 OZ., 100% POLYESTER FABRIC	
CHEMICAL	GEON® 460X49
MANUFACTURER	B.F. GOODRICH COMPANY
KNOWN CHEMICAL COMPOSITION	SYNTHETIC ANIONIC COLLOIDAL EMULSION OF VINYL CHLORIDE COPOLYMER (49%) IN WATER (51%).
PERCENTAGE OF CHEMICAL IN WATER BATH	11.5
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	10.5
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	147/50

TABLE NO. 3
100% URETHANE POLYMER WITH ALIPHATIC DIISOCYANATE, POLYESTER SOFT SEGMENT AND BROMINATED MONOMER APPLIED ON 1.7 OZ., 100% POLYESTER FABRIC.

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
KNOWN ADDITIONAL CHEMICAL INGREDIENTS	2-PYRROLIDINONE 1-METHYL DIPROPYLENE GLYCOL MONOMETHYL ETHER N,N DIMETHYLETHANOLAMINE	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	15%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	45/41	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY 302 HORIZONTAL FLAME TEST	WARP	SELF EXTINGUISHING PASS
	FILLING	
ASTM 701 VERTICAL FLAME TEST	WARP	4.1, 0,0 PASS
	FILLING	4.3, 0,0 PASS
LIGHT FASTNESS	4.0 (RED)	
PLEATING	2.75 INCHES	
PLEAT RETENTION	6 INCHES FOR AFTER 1 HOUR @ 170°F	

TABLE NO. 4
100% URETHANE POLYMER WITH ALIPHATIC DIISOCYANATE, POLYESTER SOFT SEGMENT AND BROMINATED MONOMER APPLIED ON 1.7 OZ., 100% POLYESTER FABRIC.

CHEMICAL	SANCURE® 12194	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	11.7%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	28/14.5	
FEDERAL MOTOR VEHICLE SAFETY 302 HORIZONTAL FLAME TEST	WARP	SELF EXTINGUISHING PASS
	FILLING	
ASTM 701 VERTICAL FLAME TEST	WARP	5.1, 0,0 PASS
	FILLING	5.3, 0,0 PASS

TABLE NO. 5
100% URETHANE POLYMER WITH ALIPHATIC DIISOCYANATE, POLYESTER SOFT SEGMENT APPLIED ON 1.7 OZ., 100% POLYESTER FABRIC.

CHEMICAL	SANCURE® 861	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
KNOWN ADDITIONAL CHEMICAL INGREDIENTS	TRIETHYLAMINE	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	27.5/13.5	
FEDERAL MOTOR VEHICLE SAFETY 302 HORIZONTAL FLAME TEST	WARP	SELF EXTINGUISHING PASS
	FILLING	
ASTM 701 VERTICAL FLAME TEST	WARP	5.3, 0,0 PASS
	FILLING	4.4, 0,0 PASS
LIGHT FASTNESS	4.0	

TABLE NO. 6
100% URETHANE POLYMER WITH ALIPHATIC DIISOCYANATE, POLYESTER SOFT SEGMENT AND BROMINATED MONOMER APPLIED ON 3.0 OZ., 100% POLYESTER FABRIC.

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
KNOWN ADDITIONAL CHEMICAL INGREDIENTS	2-PYRROLIDINONE 1-METHYL DIPROPYLENE GLYCOL MONOMETHYL ETHER N,N DIMETHYLETHANOLAMINE	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	11.9%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	197/64	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY 302 HORIZONTAL FLAME TEST	WARP	SELF EXTINGUISHING PASS
	FILLING	
ASTM 701 VERTICAL FLAME TEST	WARP	4.5, 0,0 PASS
	FILLING	2.6, 0,0 PASS
LIGHT FASTNESS	4-5	
PLEATING	2 INCHES	
PLEAT RETENTION	3.75 INCHES AFTER 1 HOUR @ 170°F	

TABLE NO. 7
100% URETHANE POLYMER WITH ALIPHATIC DIISOCYANATE, POLYESTER SOFT SEGMENT AND BROMINATED MONOMER APPLIED ON 3.0 OZ., 100% POLYESTER FABRIC.

CHEMICAL	SANCURE® 12194	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	13%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	95/34	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY 302 HORIZONTAL FLAME TEST	WARP	FAIL
	FILLING	SELF EXTINGUISHING PASS

TABLE NO. 8
100% URETHANE POLYMER WITH ALIPHATIC DIISOCYANATE, POLYESTER SOFT SEGMENT ON 3.0 OZ., 100% POLYESTER FABRIC.

CHEMICAL	SANCURE® 861	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
KNOWN ADDITIONAL CHEMICAL INGREDIENTS	TRIETHYLAMINE	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	94/33	
FEDERAL MOTOR VEHICLE SAFETY 302 HORIZONTAL FLAME TEST	WARP	SELF EXTINGUISHING PASS
	FILLING	SELF EXTINGUISHING PASS
ASTM 701 VERTICAL FLAME TEST	WARP	4.2, 0,0 PASS
	FILLING	4.7, 0,0 PASS
BLOCKING AT 350°F	PASS	

TABLE 9
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	RHOPLEX® AC-604	
MANUFACTURER	ROHM AND HAAS COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	40%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	34%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	71/56	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	FAIL
	FILLING	FAIL
ASTM 701 VERTICAL FLAME TEST	WARP	FAIL
	FILLING	FAIL
PLEATING	1.25 INCHES	
PLEAT RETENTION	4 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	.75/1	
% URETHANE	42.8%	

TABLE 10
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	RHOPLEX® AC-604	
MANUFACTURER	ROHM AND HAAS COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	37.8%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	32.4%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	63/51	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	FAIL
	FILLING	FAIL
ASTM 701 VERTICAL FLAME TEST	WARP	FAIL
	FILLING	FAIL
PLEATING	1.25 INCHES	
PLEAT RETENTION	3.75 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	2.3/1	
% URETHANE	69.7%	

TABLE 11
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	RHOPLEX® AC-604	
MANUFACTURER	ROHM AND HAAS COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	10-12%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	54/35	
HYSTERESIS	-18/-15	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	FAIL
	FILLING	FAIL
ASTM 701 VERTICAL FLAME TEST	WARP	FAIL
	FILLING	FAIL
PLEATING	1.75 INCHES	
PLEAT RETENTION	5.5 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	1/1	
% URETHANE	50%	

TABLE 12
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	RHOPLEX® AC-604	
MANUFACTURER	ROHM AND HAAS COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	10-12%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	47/34	
HYSTERESIS	-18/-13	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	PASS
	FILLING	PASS
ASTM 701 VERTICAL FLAME TEST	WARP	PASS
	FILLING	PASS
PLEATING	1.75 INCHES	
PLEAT RETENTION	5.25 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	3/1	
% URETHANE	75%	

TABLE 13
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	GEON® 460X49	
MANUFACTURER	B. F. GOODRICH COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	42.5%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	36%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	84/50	
BLOCKING AT 350°F	SLIGHT	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	FAIL
	FILLING	FAIL
ASTM 701 VERTICAL FLAME TEST	WARP	FAIL
	FILLING	FAIL
PLEATING	1.0 INCHES	
PLEAT RETENTION	6.0 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	.7/1	
% URETHANE	41.2%	

TABLE 14
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	GEON® 460X49	
MANUFACTURER	B. F. GOODRICH COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	38.8%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	33%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	67/46	
BLOCKING AT 350°F	VERY SLIGHT	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	PASS
	FILLING	PASS
ASTM 701 VERTICAL FLAME TEST	WARP	PASS
	FILLING	FAIL
PLEATING	1.5 INCHES	
PLEAT RETENTION	4.75 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	2.1/1	
% URETHANE	67.7%	

TABLE 15
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	GEON® 460X49	
MANUFACTURER	B. F. GOODRICH COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	10-12%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	44/32	
HYSTERESIS	-18/-18	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	PASS
	FILLING	PASS
ASTM 701 VERTICAL FLAME TEST	WARP	PASS
	FILLING	PASS
PLEATING	1.5 INCHES	
PLEAT RETENTION	6.75 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	1/1	
% URETHANE	50%	

TABLE 16
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	GEON® 460X49	
MANUFACTURER	B. F. GOODRICH COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	10-12%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	49/31	
HYSTERESIS	-18/-14	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	PASS
	FILLING	PASS
ASTM 701 VERTICAL FLAME TEST	WARP	PASS
	FILLING	FAIL
PLEATING	2.0 INCHES	
PLEAT RETENTION	5.75 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	3/1	
% URETHANE	75%	

TABLE 17
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	RHOPLEX® HA-16	
MANUFACTURER	ROHM AND HAAS COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	40%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	34%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	67/45	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	FAIL
	FILLING	FAIL
ASTM 701 VERTICAL FLAME TEST	WARP	FAIL
	FILLING	FAIL
PLEATING	1.5 INCHES	
PLEAT RETENTION	5.25 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	.75/1	
% URETHANE	42.8%	

TABLE 18
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	RHOPLEX® HA-16	
MANUFACTURER	ROHM AND HAAS COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	37.8%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	32.4%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	65/51	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	FAIL
	FILLING	FAIL
ASTM 701 VERTICAL FLAME TEST	WARP	PASS
	FILLING	FAIL
PLEATING	1.5 INCHES	
PLEAT RETENTION	3.75 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	2.3/1	
% URETHANE	69.7%	

TABLE 19
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	RHOPLEX® HA-16	
MANUFACTURER	ROHM AND HAAS COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	36.8%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	31.5%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	65/46	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	PASS
	FILLING	PASS
ASTM 701 VERTICAL FLAME TEST	WARP	PASS
	FILLING	PASS
PLEATING	1.75 INCHES	
PLEAT RETENTION	4.0 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	3.8/1	
% URETHANE	79.1%	

TABLE 20
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	RHOPLEX® HA-16	
MANUFACTURER	ROHM AND HAAS COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	10-12%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	41/31	
HYSTERESIS	-31/-17	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	PASS
	FILLING	PASS
ASTM 701 VERTICAL FLAME TEST	WARP	PASS
	FILLING	FAIL
PLEATING	2.0 INCHES	
PLEAT RETENTION	6.75 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	1/1	
% URETHANE	50%	

TABLE 21
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	RHOPLEX® HA-16	
MANUFACTURER	ROHM AND HAAS COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	10-12%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	41/33	
HYSTERESIS	-15/-9.6	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	PASS
	FILLING	PASS
ASTM 701 VERTICAL FLAME TEST	WARP	PASS
	FILLING	PASS
PLEATING	2.0 INCHES	
PLEAT RETENTION	6.125 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	3/1	
% URETHANE	75%	

TABLE 22
BLEND OF URETHANE POLYMER AND ACRYLIC POLYMER COATING 1.7 OZ. TEXTILE FABRIC

CHEMICAL	SANCURE® 1049A	
MANUFACTURER	SANNCOR INDUSTRIES, INC.	
CHEMICAL	RHOPLEX® HA-16	
MANUFACTURER	ROHM AND HAAS COMPANY	
PERCENTAGE OF CHEMICAL IN WATER BATH	14%	
PERCENTAGE OF FINISH IN RELATION TO TOTAL WEIGHT OF FABRIC AND DRIED FINISH	10-12%	
STIFFNESS ACROSS WARP YARNS/FILL YARNS (GRAMS)	41/30	
HYSTERESIS	-18/-16	
BLOCKING AT 350°F	PASS	
FEDERAL MOTOR VEHICLE SAFETY STANDARD 302 HORIZONTAL FLAME TEST	WARP	PASS
	FILLING	PASS
ASTM 701 VERTICAL FLAME TEST	WARP	PASS
	FILLING	PASS
PLEATING	2.0 INCHES	
PLEAT RETENTION	5.75 INCHES AFTER 1 HOUR @ 170°F	
SOLIDS BASIS URETHANE/ OTHER	5/1	
% URETHANE	83.3%	

Claims

1 A urethane polymer finish for applying to a textile fabric, said polymer finish comprising a diisocyanate and a polyester and/or polyether soft segment.

2 A urethane polymer finish as claimed in Claim 1 wherein said diisocyanate is an aliphatic diisocyanate.

3 A urethane polymer finish as claimed in either one of Claims 1 and 2 wherein said diisocyanate is an aromatic diisocyanate.

4 A urethane polymer finish as claimed in any one of Claims 1 to 3 comprising a polyester soft segment.

5 A urethane polymer finish as claimed in any one of Claims 1 to 4 comprising a polyether soft segment.

6 A urethane polymer finish as claimed in any one of Claims 1 to 5 further comprising a halogenated moiety.

7 A urethane polymer finish as claimed in Claim 6 wherein said halogenated moiety is a brominated moiety.

8 A urethane polymer finish as claimed in Claim 6 wherein said halogenated moiety is a chlorinated moiety.

9 A urethane polymer finish as claimed in any one of Claims 1 to 8 comprising at least 45 percent by weight of urethane polymer.

10 A urethane polymer finish as claimed in any one of Claims 1 to 9 that after drying comprises an acrylic polymer and at least 45 weight percent of a urethane polymer.

11 A urethane polymer finish as claimed in any one of Claims 6 to 10 whereby said textile fabric treated with said urethane polymer finish passes both the ASTM 701 Vertical Flame test and the USA Federal Motor Vehicle Safety Standard 302 Horizontal Flame Test.

12 A urethane polymer finish as claimed in any one of Claims 1 to 11 that after drying comprises at least 75 percent by weight of urethane polymer.

13 A urethane polymer finish as claimed in any one of Claims 1 to 12 that after drying comprises at least 90 percent by weight of urethane polymer.

14 A urethane polymer finish as claimed in any one of Claims 1 to 13 that after drying comprises a cross-linker and at least 45 percent by weight of urethane polymer.

15 A urethane polymer finish as claimed in any one of Claims 1 to 14 having a softening point above 100°C.

16 A process for treating a textile fabric wherein a urethane polymer finish as claimed in any one of Claims 1 to 15 is applied to said textile fabric.

17 A process as claimed in Claim 16 wherein said urethane polymer finish is padded onto said textile fabric.

18 A process as claimed in Claim 16 wherein said urethane polymer finish is coated onto said textile fabric.

19 A process as claimed in any one of Claims 16 to 18 wherein the dry weight of said textile fabric is increased by a total of from 6 to 20% by application of said polymer finish.

20 Use of a urethane polymer finish as claimed in any one of Claims 1 to 15 for application to a textile fabric.

21 Use as claimed in Claim 20 wherein said textile fabric forms a stiff window covering.

22 A textile fabric treated with a urethane polymer finish as claimed in any one of Claims 1 to 15.

23 A textile fabric as claimed in Claim 22 which forms a stiff window covering.

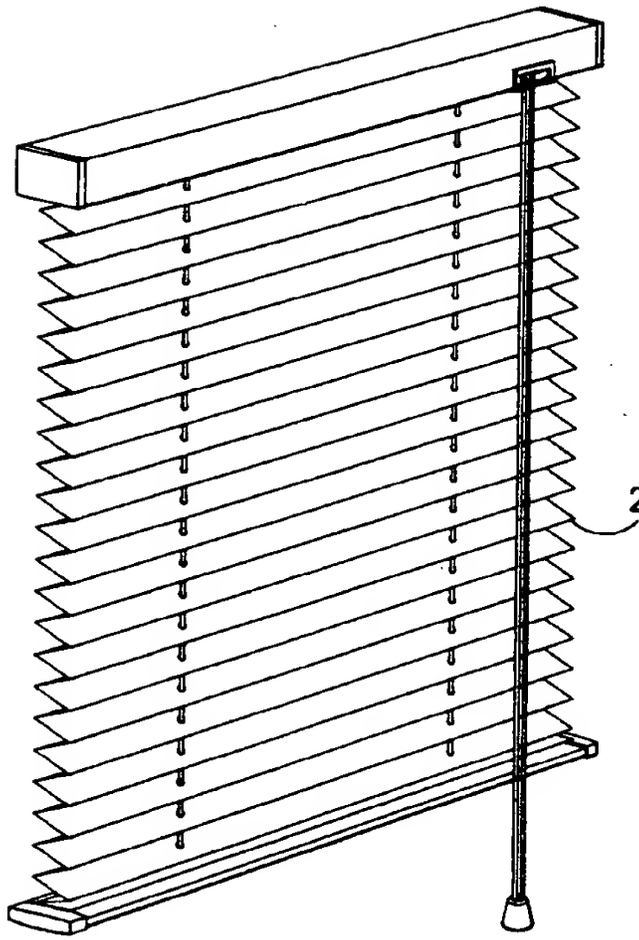

FIG. -1-

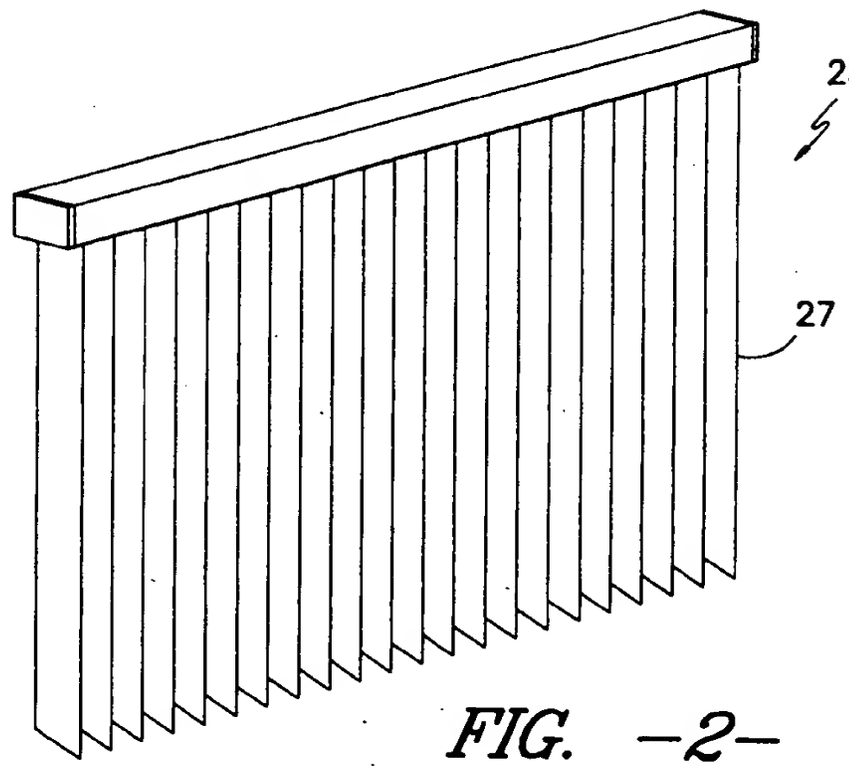

FIG. -2-

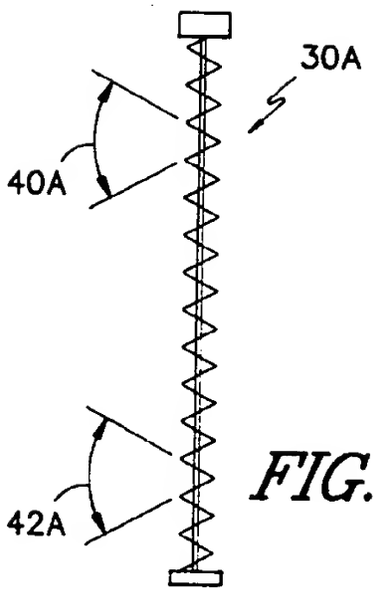

FIG. —3—

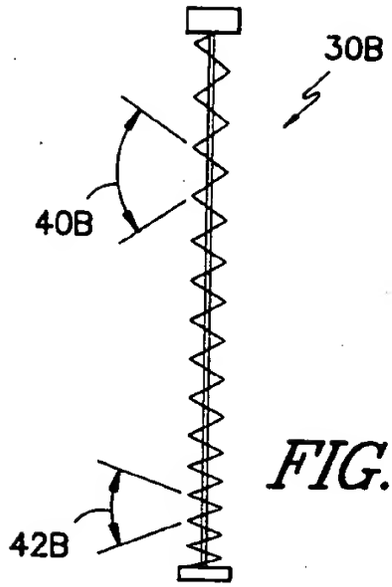

FIG. —4—

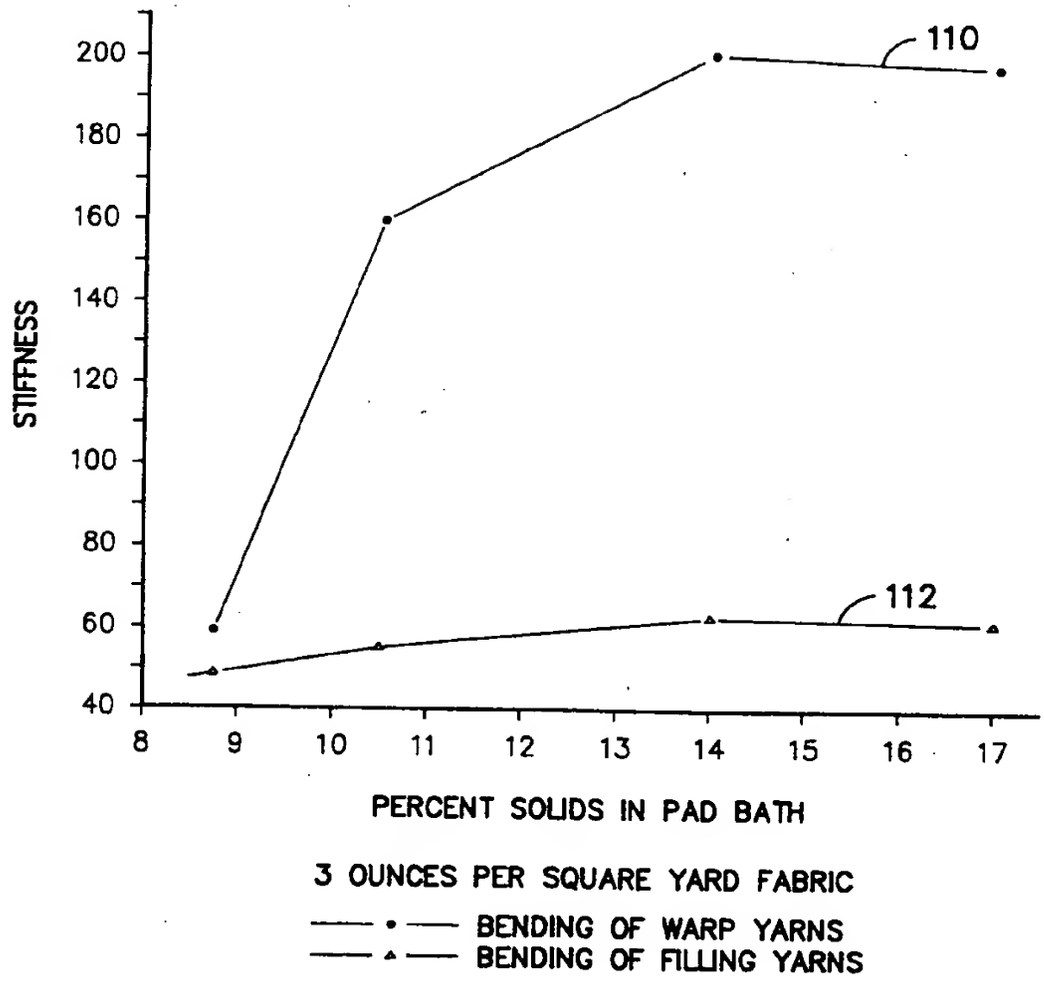

FIG. —5—

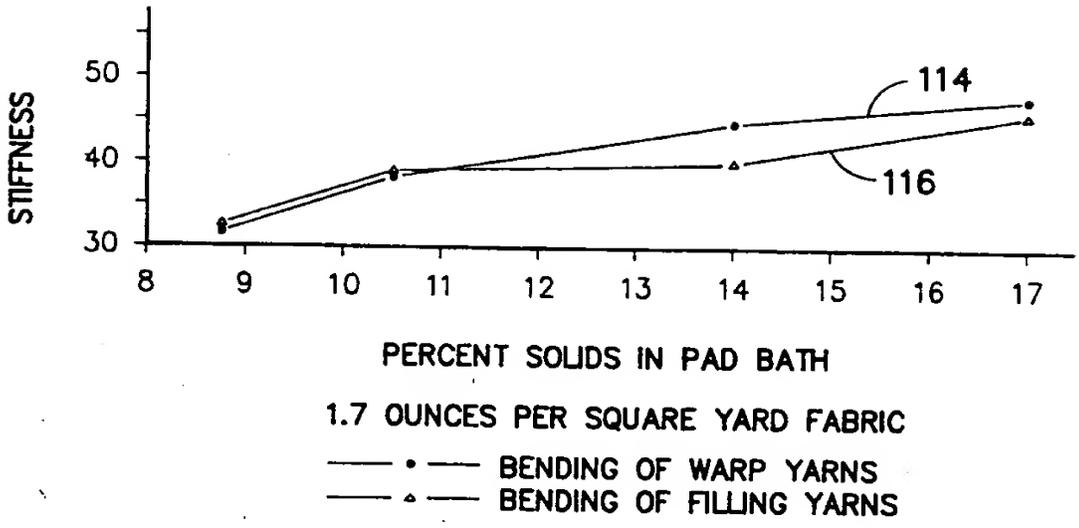

FIG. —6—

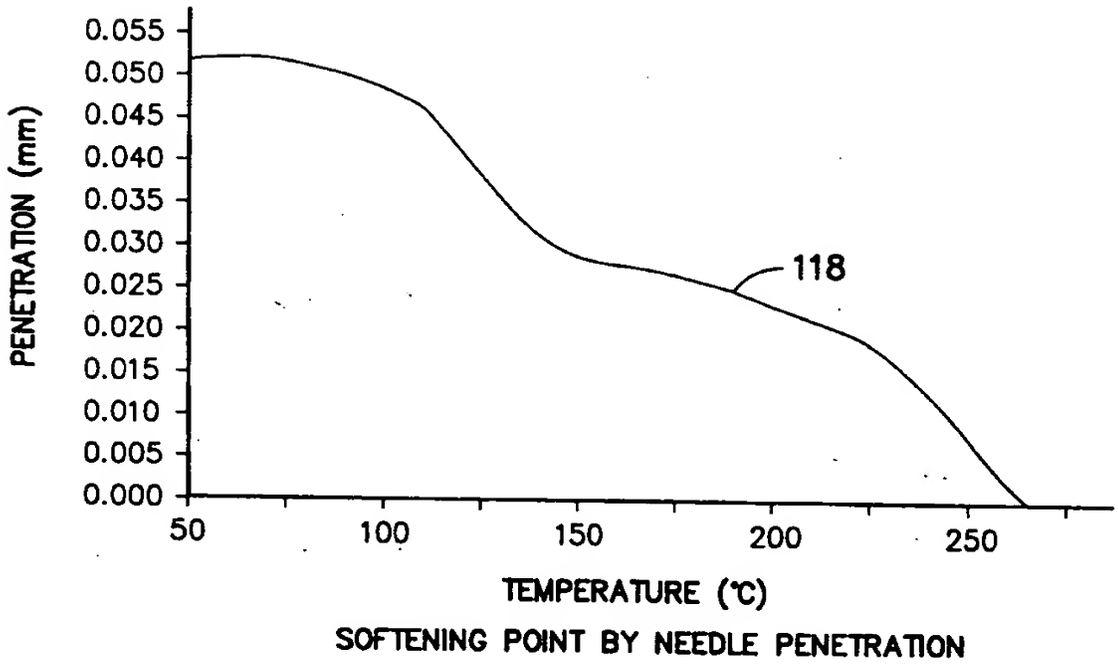

FIG. —7—

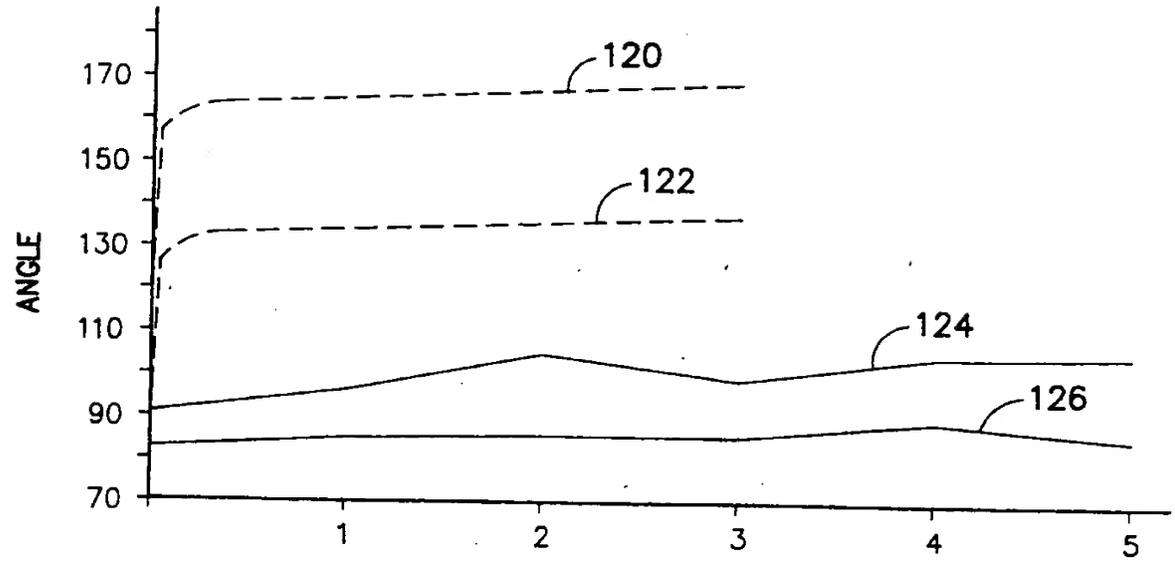

FIG. —8—

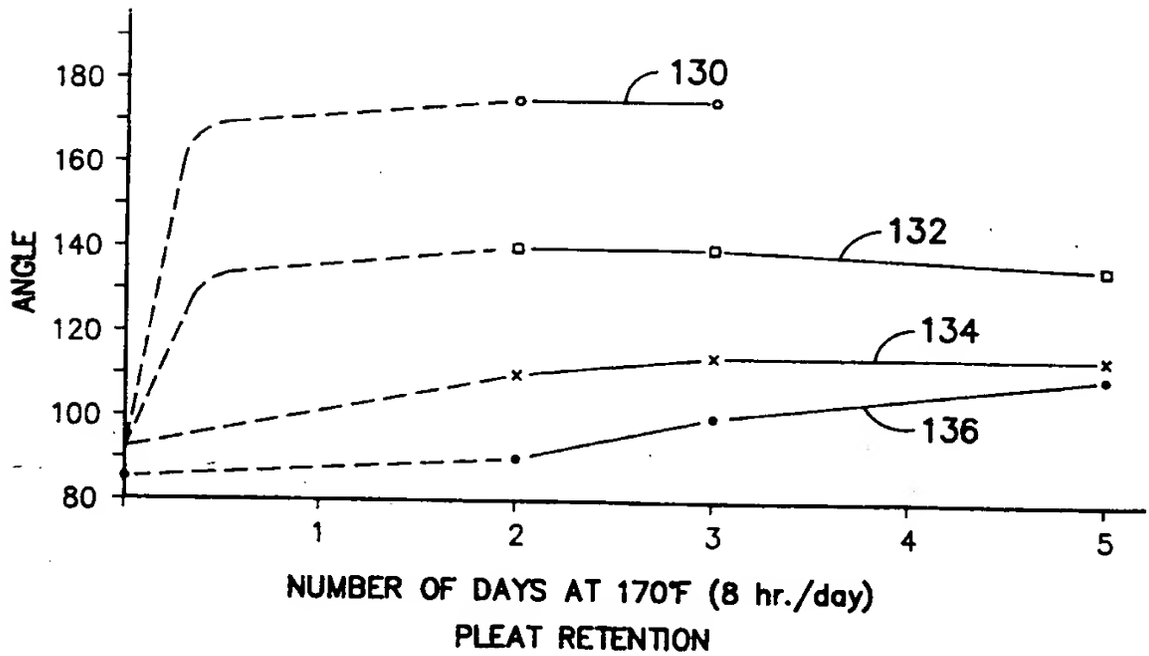

FIG. —9—

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 30 7479

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	FR-A-2 628 125 (HEXCEL-GENIN) * page 1, line 33 - page 2, line 15 * * page 2, line 23 - page 4, line 28; claims *	1-9, 11-23	D06M15/568 D06M15/572 D06N3/14
X	EP-A-0 301 214 (BAYER AG) * page 4, line 33 - page 5, line 40; claims *	1-5, 12-14, 16-23	
X	US-A-5 208 313 (KRISHNAN) * claims *	1-3,5, 16,18,20	
A	DE-A-16 19 238 (FARBENFABRIKEN BAYER AG) * the whole document *	1-23	
A	DE-A-25 58 350 (KURARAY CO., LTD.) * the whole document *	1,10	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	US-A-4 707 400 (TOWERY) * claims *	1,10	D06M D06N

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	7 February 1995	Blas, V

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)